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RECOMMENDATIONS FOR DRAWING UP A 1961-1962 RESEARCH PLAN
TO DEAL WITH PHARMACEUTICAL PROBLEMS

- USSR -

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RECOMMENDATIONS FOR DRAWING UP A 1961-1962 RESEARCH PLAN
TO DEAL WITH PHARMACEUTICAL PROBLEMS

USSR

Following is a translation of an article by Professor P. L. Senov, chairman of Problem Committee No. 47 of the Academy of Medicine of the USSR, and A. K. Mel'nichenko, director of the Central Pharmacy Research Institute in the Russian-language periodical Aptechnoye delo (Pharmacy), Vol. IX, No. 2, March-April 1960, pp. 6-11.

With regard to special problem No. 1 "Studying Medical Botanical Resources of the USSR," Problem Committee No. 47 of the Academy of Medicine of the USSR recommends that research workers concentrate their attention on the following questions:

- a) VILAR Vsesoyuznyy institut po issledovaniyu lekarstv i aromaticeskikh rasteniy -- All Union Institute of Drug and Aromatic Plant Research, the Kharkov NIKhFI Nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut -- Institute for Research in Pharmaceutical Chemistry, the Tiflis NIKhFI, departments of pharmacognosy and botany of pharmaceutical institutes and faculties; discover and study new as well as little studied species of medicinal plants and medicinal plants taken from popular medicine;
- b) VILAR and departments of pharmaceutical institutes and faculties: make a more complete study of wild medicinal plants and set up an inventory of resources and location for purposes of establishing a raw material supply in different areas of the country; special expeditions must be sent to investigate the flora of separate areas in order to compile manuals on gathering raw medicinal plant material during the current seven-year period;
- c) pharmaceutical institutes with their own nurseries or appropriate bases and VILAR: study the cultivation, cultivation procedures and breeding of medicinal plants, do cytological research and work in creating polyploid forms of valuable medicinal plants;
- d) VILAR - work out a unified method for sowing promising plants in the different climatic zones of the country;
- e) VILAR, Kharkov NIKhFI, Tiflis NIKhFI and departments of pharmaceutical institutes and faculties: investigate and improve methods for drying raw drug materials since a commercial study of

raw material and its analysis is of current importance for pharmacognosy; the results of this work must serve as material for improving existing articles in the USSR Pharmacopoeia;

f) departments of pharmacognosy and pharmaceutical chemistry of pharmaceutical colleges: make a joint study of the dynamics of the accumulation of active principles in plants at different stages of development for the purpose of determining the most efficient time for harvesting medicinal plants;

g) Tiflis NIKhFI, Moscow and Dnepropetrovsk Pharmacy Faculties: continue the study of the question of the trace element content of plant raw material, particularly in certain preparations.

With respect to Problem II "Developing and Improving Methods for Preparing Drug Compounds and Galenicals" all pharmaceutical research and training institutes must considerably expand:

a) theoretical studies on the individual drug forms in order to determine their internal structure and properties through research;

b) the investigation of the possibility of preparing galenicals and new galenicals from new medicinal plants and plants used in popular medicine;

c) investigations in the use of chromatographic absorption methods for separating active principles from plants and obtaining pharmaceutical preparations;

d) the study of the compatibility of therapeutic substances, particularly new preparations;

e) the study of frequently repeated prescriptions, making a selection and determining the technical conditions necessary for having them compounded at the factory;

f) the investigation of the adoption of small-scale mechanization in the production of compounds and galenicals;

g) the improvement of technological methods used in the USSR Pharmacopoeia.

Recommendations for individual institutions and organizations:

a) TsANII [Tsentral'naya assotsiatsiya nauchno-issledovatel'skikh institutov -- Central Association of Research Institutes], Kharkov NIKhFI, Tiflis NIKhFI, TsNIAL [Tsentral'naya nauchno-issledovatel'skaya aptechnaya laboratoriya -- Central Pharmacy Research Laboratory], Leningrad KhFI, Pyatigorsk Pharmaceutical Institute and the Pharmaceutical Faculty of the First Moscow Medical Institute: aim at developing new types of compounds providing ease of administration and fast and long action; studies aimed at substituting oral forms for injections and developing compounds with radioisotopes;

b) TsANII, Kharkov NIKhFI, Leningrad KhFI: extend research on the possibility of using plastics in pharmaceutical

practice, including the development of containers, measuring vessels, stoppers, etc.;

c) Kharkov NIKhFI, Leningrad KhFI, VILAR: broader research on the process of plant material extraction and apparatus for large-scale and small-scale production;

d) Kharkov NIKhFI, Leningrad KhFI and the Tashkent Pharmaceutical Institute: pay particular attention to studying tablet production, including the problem of pressing coatings on tablets;

e) TsANII and TsNIAL - speed up research on producing high-grade distilled water in the pharmacy for the preparation of compounds and solutions for injections (apyrogen);

f) NIKhFI, TsANII and the Pharmaceutical Faculty of the First Moscow Medical Institute; intensify research on creating children's compounds and finding corrigents for them;

g) Perm Pharmaceutical Institute: combine the production of preparations from raw material containing tannin substances with the development of methods for analyzing tannin substances both in raw material and in preparations and strive to separate the tannin substances;

h) the same institute: expand the study of the rheological properties of medicinal preparations and compounds;

i) Pharmaceutical Faculty of the First Moscow Medical Institute: expand research on extracting raw materials, particularly such samples as adonis and belladonna and others from which factories make a great number of preparations;

With respect to Problem III "Developing New Methods for Analyzing Drug Substances, and Improving and Standardizing Current Ones" the common problem for the departments of pharmaceutical institutes and faculties, and for the VNIKhFI, TsANII, Kharkov NIKhFI, Tiflis NIKhFI and TsNIAL is the search for specific qualitative reactions to drugs and the development of new methods for a qualitative and quantitative analysis of pharmaceutical preparations and drug compounds. In working out topics in this area particular attention should be given to obtaining specific qualitative reactions to new pharmaceutical preparations and developing methods for a qualitative and quantitative analysis of mixtures of drugs. In this respect it is recommended that there be a general expansion of research on the use of physico-chemical methods in pharmaceutical analysis. Important for departments (laboratories) of pharmaceutical chemistry and the technology of compounds and galenicals will be experimental studies on the stability of drugs, particularly in the form of solutions for injections, depending on different factors.

Recommendations for individual institutions:

a) TsANII, VNIKhFI, Kharkov NIKhFI, Leningrad KhFI, Zaporozh'ye Pharmaceutical Institute and the Pharmaceutical Faculty

of the First Moscow Medical Institute: expand research on developing and putting into practice chromatographic methods for analyzing drugs, particularly in mixtures (research must be stepped up on the use of ion exchange chromatography in pharmacopoeial analysis, etc.);

b) TsANII, VNIKhFI, Kharkov NIKhFI, Leningrad KhFI, Pyatigorsk, Zaporozh'ye, Perm and Tashkent Pharmaceutical Institutes, Moscow, Dnepropetrovsk, and Kaunas Pharmaceutical Faculties and the Pharmaceutical Division of Tartu State University: intensify work in developing topics on the use of pharmaceutical analysis of photolorimetric, photoelectric, polarigraphic, electrometric, luminescent and microcrystalloscopic methods and the complexonometry and titration of drugs in nonaqueous solutions;

c) TsANII, Pyatigorsk, Tashkent and Kharkov Pharmaceutical Institutes and the Moscow and Tiflis Faculties: extend research on express modifications of methods of analysis for pharmacy control of drugs; developing micro- and semimicro methods for analyzing drugs and their mixtures is of great practical value for control laboratories and pharmacies;

d) VILAR, Kharkov NIKhFI, Tiflis NIKhFI, Leningrad KhFI, Kharkov Pharmaceutical Institute and the Pharmaceutical Faculty of the First Moscow Medical Institute: find and improve methods for analyzing biologically active natural compounds for the purpose of developing new and simple methods for determining the amount of active substances in raw plant material and galenicals;

e) TsANII, VILAR, Leningrad KhFI, Zaporozh'ye, Perm, and Tashkent Pharmaceutical Institutes, Moscow, Riga, Tiflis and Tomsk Pharmaceutical Faculties and other institutions and organizations where working conditions exist: organize an experimental study of the keeping quality of plant materials, manufactured compounds, galenicals and drugs prepared in pharmacies in different geographical zones of the country.

Taking into consideration the scientific trend in the work of departments and courses in forensic chemistry and the demands of legal investigations and forensic medicine in this common line (forensic chemical proof of poisons in biological material) it is recommended that particular attention be given theoretical and practical problems in isolating metal compounds from objects of biological origin, in developing detailed methods for detecting and determining compounds of important toxicological metals by using chromatography to separate them from mineralizers and in studying new and promising chemical and physicochemical methods (microcrystalloscopy, luminescence analysis, colorimetry and photolorimetry, complexonometry, titration in nonaqueous media, polarigraphy, spectrography, etc.) for their detection and determination; to the study and further development of methods for isolating, detecting and making a quantitative determination

of derivatives of barbituric acid, which are of toxicological importance (Pharmaceutical Faculty of the First Moscow Medical Institute), to the study and improvement of methods for isolating from biological material alkaloids depending on the pH of the medium (Lvov Pharmaceutical Institute) and to their isolation through electro dialysis for purposes both of pharmaceutical and forensic chemical analysis (Kazakh Pharmaceutical Faculty); to developing methods of chromatography for isolating and separating alkaloids in forensic chemical analysis (Pyatigorsk, Kharkov and Perm Pharmaceutical Institutes) and microcrystalloscopy with optical methods for detecting them (Lvov Pharmaceutical Faculty). Particular attention should be given to a phytochemical study of poisonous plants (Azerbaijan, Dnepropterovsk and Tashkent Pharmaceutical Institutes) and to studying methods for isolating, detecting and determining ethyl alcohol (Pharmaceutical Faculty of the First Moscow Medical Institute).

For the teaching staff in forensic chemistry in the Riga, Irkutsk, Tomsk, Kaunas and Tartu Pharmaceutical Faculties and the Leningrad and Zaporozh'ye Pharmaceutical Institutes it is recommended that research topics be related to the theory and practice of forensic chemistry.

With respect to Problem IV "Organization and Economic Studies in the Field of Pharmacy" it is recommended that attention be centered on developing the following main lines.

1. Theory and history of pharmacy. In this area all pharmaceutical research institutes and training schools should plan topics aiming at:

a. theoretical generalization of practices in building up the pharmacy field in the USSR;

b. developing such theoretical problems as the role and place of pharmacy in the Soviet public health system, features of the development of the pharmacy system during the transition from socialism to communism, and the relation between the development of pharmaceutical research and practices in providing the public with drugs, etc.

c. the study and theoretical analysis of features of the development of the field of pharmacy abroad.

2. Scientific principles in the organization of a system for providing drugs for the public. Studies in this field must be intensified. Research should be planned for the purpose:

a. of developing scientifically grounded principles and forms in the organization of the pharmacy service during the extensive development of communism (TsANII, TsNIAL, Leningrad KhFI, Kharkov and Pyatigorsk Pharmaceutical Institutes and the Pharmaceutical Faculty of the First Moscow Medical Institute);

b. establishing the most efficient organization of pharmacy administration in the province, territory and republic;

c. working out methodological principles for determining the public requirements for medicines and drugs and the norms for the amounts of medicines and drugs used;

d. working out well-founded standards for stocks in pharmacies and drug dispensaries or various types and categories for the different geographical and economic regions of the USSR;

e. solving problems in efficient labor organization at pharmacy institutions and establishments, production standards and staff size;

f. studying and generalizing progressive practices of pharmacy institutions in the USSR and abroad, testing them experimentally and adopting them in practice;

g. studying the status and development of the training of pharmacy personnel at the professional and sub-professional level as applied to the objectives and requirements of the public health system (research outlined in points b, c, d, e and g should be done at all pharmaceutical institutes, in faculties, and in pharmacy and research institutions);

h. improving current technological patterns and planning solutions and developing new ones for standard plans of pharmacies, pharmacy warehouses and the production of galenicals and drugs as well as setting up standards for sanitary working conditions (TsANII, TsNIAL, Leningrad KhFI, Tashkent and Kharkov Pharmaceutical Institutes).

3. Planning and keeping records of the management and finance of pharmacy institutions and establishments.

Research along this line should be done by the TsANII, TsNIAL, the Leningrad KhFI, Kharkov, Paytigorsk and Tashkent Pharmaceutical Institutes and in the Pharmaceutical Faculty of the First Moscow Medical Institute. The research efforts of these organizations should be concentrated on:

a. working out well grounded principles and methods for planning in the pharmacy field;

b. determining future requirements of the public for a supply of drugs and working out corresponding norms;

c. working out principles for the expansion and geographical distribution of pharmacies and other pharmaceutical institutions and proposals for their most effective size;

d. improving methods in planning and keeping records of the management and finance of pharmacy institutions and establishments;

e. studying factors which effect the profit of pharmacy institutions and establishments.

With respect to Provlem V "Biological Standardization of Cardiac Crugs" it is recommended:

1. for TsANII: a) studying the possibility of using mixtures of the glycosides digitoxin and gitoxin as a standard for rating digitalis preparations; b) comparing current methods

of biological rating and selecting the most effective for the biological standardization of cardiac drugs; c) studying the biological activity of adonisin, convazid and lanthozid in animals after storage at different temperatures; d) analyzing work in the biological standardization of medicinal raw materials and preparations containing cardiac glycosides received from outlying pharmacy administration by TsANII during the period 1957-1961; e) making a biological rating of preparations containing cardiac glycosides received from pharmacy administrations and pharmaceutical plants of the TsANII.

2. For VILAR: a) studying the biological activity of new preparations made by the institute and containing cardiac glycosides; b) developing standards for a biological rating of new medicinal plants containing cardiac glycoside and under study at the institute; c) developing standards for the biological rating of preparations of erysimum and oleander.

3. For the Kharkov NIKhFI: a) work out new methods for the biological rating of cardiac glycosides in animals; b) work out standards for the biological rating of preparations of hellebore and others; c) study the biological activity of new cardiac glycoside preparations made by the institute.

4. For the Tiflis NIKhFI: a) work out new methods for the biological rating of cardiac drugs in animals; b) work out standards for the biological rating of digitalis preparations and others.

5. For pharmacology departments of pharmaceutical institutes and faculties: studying the biological activity of raw drug materials and preparations containing cardiac glycosides with relation to conditions and time of storage.

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